REMARKS

Enclosed herewith is a Petition Under 37 CFR 1.137(b) to Revive – Unintentional Abandonment of Application.

The Examiner is requested to acknowledge receipt of a certified copy of FR 00 04407 filed under 35 USC 119.

The Examiner is requested to indicate his approval for the proposed correction to Figure 2, in which, as shown in red on the enclosed copy, reference numeral 3 has been added.

The written description is amended at paragraph [0019] to more particularly briefly describe Figure 5 and conform to the Detailed Description of Figure 5. The written description is amended at paragraphs [0023], [0026] and [0048] to improve grammatical style and conform to U.S. patent practice. The written description is amended at paragraphs [0034] and [0042] to conform the text to the priority application at page 7, line 5 ("filtre") and at page 2, line 27 ("ou d'une lame"). Further [0034] has been amended to indicate the relationship between the curves of the described structure and the structure shown in Figures 2 to 4. The entire contents of the priority application are incorporated by reference at paragraph [0001].

The specification is objected to under 35 USC 112, first paragraph and claims 1 to 28 are rejected under 35 USC 112, first paragraph; claims 1 to 28 are rejected under 35 USC 112, second paragraph; and claims 1 to 28 are rejected under 35 USC 103 as unpatentable over Quint et al. (US 5,734,693).

The applicant respectfully traverses and disagrees with the objection and rejection under 35 USC 112, first paragraph. The Examiner's understanding of the invention appears to be inaccurate. The optical filter has a transmission spectrum that is not dependent on the temperature of the intensifier. The optical filter has a transmission spectrum that is determined by the emission spectrum, i.e., output, of the intensifier and that emission spectrum is affected by temperature. No measurement or control of temperature or means for determination of temperature is necessary per se and no adjustment to filter performance is per se necessary. The combination of an appropriately

selected detector medium and an appropriately selected intensifier medium and an appropriately selected optical filter medium determine the operative characteristics of the device. The applicant has discovered that temperature-dependence of the output of an intensifier only occurs at specific wavelengths. This discovery permits overcoming the temperature dependence by providing an optical filter having an appropriate transmission spectrum between the intensifier and the radiation detector.

The enabling description and operative embodiment of the disclosed invention is described most particularly with respect to Figure 5. Curve 29 shows a main peak intensifier emission at 545 nm that is only very little affected by temperature dependence. Curve 30 shows detector sensitivity for shorter wavelengths that exhibit stronger temperature dependence, e.g., less than 545 nm. Curve 31 shows a filter of the shorter wavelengths, e.g., less than 545 nm, thereby reducing temperature dependence wavelengths and increasing imaging quality.

For example, an operative and enabling embodiment of the enabling disclosed invention is described in the written description and the accompanying drawings as follows and particularly with respect to Figure 5:

If the intensifier 19 emission spectrum 29 is of the type commercially available as KODAK LANEX (see paragraph [0028]); and

if the detector medium 20 has a sensitivity curve 30 of the type commercially available as KODAK MIN-R 2000 (see paragraph [0028]); and

if the optical filter 21 has a transmission spectrum 31 of the type commercially available as GENTEX Filtron E 520 (see paragraph [0033]), then

the temperature dependent wavelengths can be avoided, i.e., decorrelated (see paragraph [0030]) or suppressed thereby improving imaging by the detector medium.

The applicant has indeed successfully reduced the invention to practice for the above combination and with the desired results (with the exception that the detector used is a photomultiplier tube instead of an X-ray film.)

For example, if the detector medium is an X-ray film, the temperature induced variation in the optical density of the X-ray film at the time of exposure can be seen when

the film is developed. The temperature induced variation can be either uniform on the whole screen surface of the intensifier, which leads to an over- or under-exposed film, or it can be locally induced temperature variation, e.g., holding the cassette with the hand, which causes local artifacts on the film.

It is therefore quite apparent that the present application has an enabling disclosure and the objection and rejection under 35 USC 112, first paragraph, is not justified and should be withdrawn.

Claims 1 to 28 are rejected under 35 USC 112, second paragraph. This rejection appears to be based on the same mischaracterization or misunderstanding as the objection and rejection under 35 USC 112, first paragraph. In that regard, the applicant's remarks with respect to the objection and rejection under 35 USC 112, first paragraph are equally applicable to the rejection under 35 USC 112, second paragraph. Specifically, no temperature definition is required; and it is second part of the spectrum of the light emitter that is shift dependent on temperature. The light emitter can be any medium, which, as indicated in the written description, that is capable of transforming incident radiation into detectable radiation (see paragraph [0020]).

Claims 1 to 28 are rejected under 35 USC 103 as being unpatentable over Quint et al. (US 5,734,693). The applicant respectfully traverses this rejection. The Examiner's observation regarding the "obscurity" of the claims is inappropriate for a consideration under 35 USC 103 and is more appropriate for a consideration under 35 USC 112. A rejection under 35 USC 103 requires, at a minimum, that the cited reference discloses or recognizes the problem to be solved and presents a solution which causes the claimed invention to be obvious to the person having ordinary skill in the art. The cited Quint et al. fails to satisfy this minimum. There is no recognition or disclosure or teaching in Quint et al. that the filter 16 has a transmission spectrum that is determined by the emission spectrum, i.e., output, of the screen 22 and that this emission spectrum is affected by temperature.

New claims 29 to 44 are presented herewith that are believed to be novel and non obvious with respect to the cited prior art.

The Examiner is requested to reconsider the application as amended and to find the claims allowable. The Examiner is requested to telephone the attorney for the applicant if the claims are not found allowable in order to resolve any issues of patentability.

Respectfully submitted,

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29. A method for radiation output comprising:

providing an intensifier having an emission spectrum in response to incident radiation;

providing a detector, which has a sensitivity to the emission spectrum;

determining a wavelength of the emission spectrum or the sensitivity that is temperature dependent; and

providing a filter between the intensifier and the detector, the filter having a transmission spectrum that suppresses the wavelength that is temperature dependent.

30. An article of manufacture comprising:

means for intensifying having an emission spectrum in response to incident radiation;

means for providing a detector that has a sensitivity to the emission spectrum, the sensitivity having a wavelength that is temperature dependent; and

means for filtering having a transmission spectrum that suppresses the wavelength that is temperature dependent.

31. The article according to claim 30 wherein the emission spectrum of the means for intensifying has a selected wavelength that is suppressed by the means for filtering.

32. The article according to claim 30 wherein the emission spectrum of the means for intensifying has a principle peak centered at around 545 nm.

33. The article according to claim 30 wherein the means for filtering and the means for intensifying are integrated.

34. The article according to claim 30 wherein the means for filtering suppresses the wavelength shorter than a principle peak of the emission spectrum of the means for intensifying.

35. The article according to claim 30 wherein the means for filtering comprises material from the group consisting of glass, polycarbonate or acetate, the material having a dye or organic or mineral pigment incorporated therein.

36. The article according to claim 30 wherein the means for filtering is a plurality of layers.

37. The article according to claim 30 wherein the means for detecting is a film.

38. The article according to claim 30 wherein the means for detecting is a photomultiplier tube.

39. The article according to claim 30 wherein the means for detecting is a charge transfer cell.

40. The article according to claim 30 wherein the mean for filtering transmits radiation close to a principle peak of the emission spectrum of the means for intensifying and intercepts radiation of wavelength corresponding to those of a secondary emission peak of wavelength less than those of the principle emission peak.

41. The article according to claim 30 wherein the means for intensifying comprises a base of gadolinium oxysulfite terbium.

42. An article of manufacture comprising:

means for intensifying having an emission spectrum in response to incident radiation;

means for providing a detector that has a sensitivity to the emission spectrum, the sensitivity having a wavelength that is temperature dependent; and

means for filtering having a transmission spectrum that suppresses the wavelength that is temperature dependent;

the means for filtering suppressing the wavelength shorter than a principle peak of the emission spectrum of the means for intensifying; and

the means for filtering being disposed between the means for intensifying and the means for detecting.

43. A radiology apparatus comprising:

a source of emitted radiation;

a cassette for receiving the emitted radiation, the cassette comprising:

means for intensifying having an emission spectrum in response to the emitted radiation;

means for providing a detector that has a sensitivity to the emission spectrum, the sensitivity having a wavelength that is temperature dependent; and

means for filtering having a transmission spectrum that suppresses the wavelength that is temperature dependent;

the means for filtering suppressing the wavelength shorter than a principle peak of the emission spectrum of the means for intensifying; and

the means for filtering being disposed between the means for intensifying and the means for detecting.

44. A radiation dose measuring module comprising:

means for intensifying having an emission spectrum in response to incident radiation;

means for providing a detector that has a sensitivity to the emission spectrum, the sensitivity having a wavelength that is temperature dependent; and

means for filtering having a transmission spectrum that suppresses the wavelength that is temperature dependent;

the means for filtering suppressing the wavelength shorter than a principle peak of the emission spectrum of the means for intensifying;

the means for filtering being disposed between the means for intensifying and the means for detecting; and

a frame supporting the means for intensifying, the means for providing a detector and the means for filtering,

the frame forming a guide for the radiation of the emission spectrum of the means for intensifying.

Paragraphs [0019], [0023], [0026], [0034], [0042] and [0048] indicating the amendment:

[0019] Figure 5 is [a] three curves showing the emission spectrum of an intensifier; the transmission sensitivity of an X-ray film as a function of wavelength; [.] and the transmission spectrum of a filter.

[0023] As illustrated [on] in Figure 1, a radiology system comprises a radiology apparatus 1, a puncture system 2, a digital or analog imaging cassette 3 and a control and treatment means. The radiology apparatus 1 comprises a base 5 resting on the floor and supporting a breast-holding plate 6 and an X-ray source 7 which can be tilted in relation to the vertical plane of symmetry of the radiology apparatus 1. The X-ray source 7 is supported by a column 8.

[0026] In operation, the X-rays are emitted by the source 7 (Figure 1), crossing the holding plate of the puncture system 2, the organ subject to the X-rays [X-rayed], the cassette holder and the upper wall of the cassette 3, and pass into the intensifier 19 which, on reception of the X-rays, emits visible light transferred to the detection element 20. A matrix camera can [make possible the transformation of] transform information received in the form of visible light into information in the form of a digital electrical [electric] signal transmitted by [the] an electric cable [13] to the control and treatment means [4].

[0034] In Figure 5 three curves are illustrated with the wavelength as the abcissa. Curve 29 schematically represents the emission spectrum of an intensifier, such as intensifier 19 or 23. Curve 30 represents the sensitivity of a photosensitive film, such as detector element 20 or 24. Curve 31 shows the evolution of transmission of an optical [fiber] filter, such as the thin layer 21 or 25.

[0042] In another embodiment of the invention, the device contains means for filtering placed below a light intensifier [on] in the path of the light. The means for filtering may [come] be in the form of a thin film or a metal sheet. The filtering element may be made with a base of glass, polycarbonate, acetate, etc., and be loaded with mineral or organic pigments.

[0048] Various modifications in structure and/or steps and/or function and equivalents thereof may be made by one skilled in the art without departing from the scope of the invention.

Clean copy of amended paragraphs [0019], [0023], [0026], [0034], [0042] and [0048] as amended.

[0019] Figure 5 is three curves showing the emission spectrum of an intensifier; the transmission sensitivity of an X-ray film as a function of wavelength; and the transmission spectrum of a filter.

[0023] As illustrated in Figure 1, a radiology system comprises a radiology apparatus 1, a puncture system 2, a digital or analog imaging cassette 3 and a control and treatment means. The radiology apparatus 1 comprises a base 5 resting on the floor and supporting a breast-holding plate 6 and an X-ray source 7 which can be tilted in relation to the vertical plane of symmetry of the radiology apparatus 1. The X-ray source 7 is supported by a column 8.

[0026] In operation, the X-rays are emitted by the source 7 (Figure 1), crossing the holding plate of the puncture system 2, the organ subject to the X-rays, the cassette holder and the upper wall of the cassette 3, and pass into the intensifier 19 which, on reception of the X-rays, emits visible light transferred to the detection element 20. A matrix camera can transform information received in the form of visible light into information in the form of a digital electrical signal transmitted by an electric cable to the control and treatment means.

[0034] In Figure 5 three curves are illustrated with the wavelength as the abcissa. Curve 29 schematically represents the emission spectrum of an intensifier, such as intensifier 19 or 23. Curve 30 represents the sensitivity of a photosensitive film, such as detector element 20 or 24. Curve 31 shows the evolution of transmission of an optical filter, such as the thin layer 21 or 25.

[0042] In another embodiment of the invention, the device contains means for filtering placed below a light intensifier in the path of the light. The means for filtering may be in the form of a thin film or a metal sheet. The filtering element may be made with a base of glass, polycarbonate, acetate, etc., and be loaded with mineral or organic pigments.

[0048] Various modifications in structure and/or steps and/or function and equivalents thereof may be made by one skilled in the art without departing from the scope of the invention.